SHILO RANCH ESTATES (PWS 4080042)
SOURCE WATER ASSESSMENT FINAL REPORT

January 3, 2006

State of Idaho
Department of Environmental Quality

Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the Act. This assessment is based on a land use inventory of the designated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

This report, *Source Water Assessment for Shilo Ranch Estates, Nampa, Idaho*, describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The Shilo Ranch Estates (PWS #4080042) drinking water system currently consists of two ground water wells. The system serves approximately 48 people through 25 connections.

Final susceptibility scores are derived from equally weighting system construction scores, hydrologic sensitivity scores, and potential contaminant/land use scores. Therefore, a low rating in one or two categories coupled with a higher rating in other category(ies) results in a final rating of low, moderate, or high susceptibility. With the potential contaminants associated with most urban and heavily agricultural areas, the best score a well can get is moderate. Potential contaminants are divided into four categories, inorganic contaminants (IOCs, e.g. nitrates, arsenic), volatile organic contaminants (VOCs, e.g. petroleum products), synthetic organic contaminants (SOCs, e.g. pesticides), and microbial contaminants (e.g. bacteria). As different wells can be subject to various contamination settings, separate scores are given for each type of contaminant.

In terms of total susceptibility, Well #2 Main rated low susceptibility for IOCs, VOCs, SOCs, and microbial bacteria, and automatically high susceptibility for SOCs. System construction and hydrologic sensitivity rated moderate susceptibility for the well. Land use rated low susceptibility for IOCs, VOCs, SOCs, and microbial bacteria (Table 1).

In terms of total susceptibility, Well #3 Backup rated low susceptibility for IOCs, VOCs, and microbial bacteria, and automatically high susceptibility for SOCs. The automatically high susceptibility ratings are due to a detection of 2, 4-D (2,4-dichlorophenoxyacetic acid) in tested water. If not for the automatically high susceptibility rating, SOCs would have rated low susceptibility. System construction rated low susceptibility and hydrologic sensitivity rated moderate susceptibility for the well. Land use rated low susceptibility for IOCs, VOCs, SOCs, and microbial bacteria (Table 1).

According to the State Drinking Water Information System (SDWIS) Database, no VOCs or microbial bacteria have ever been detected in tested water. Traces of the IOCs nitrate, barium, sodium, arsenic, cadmium, fluoride, mercury, and selenium have been detected in tested water. Concentrations of each IOC have been significantly below maximum contaminant levels (MCLs) as set by the Environmental Protection Agency (EPA). No SOCs have been detected in Well #2 Main's water, however, 2, 4-D has been detected in Well #3 Backup. The delineation exists within a priority area for the IOC fluoride.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources. If the system should need to expand in the future, new well sites should be located in areas with as few potential sources of contamination as possible, and the site should be reserved and protected for this specific use.

For the Shilo Ranch Estates, drinking water protection activities should first focus on correcting any deficiencies outlined in the sanitary survey (an inspection conducted every five years with the purpose of determining the physical condition of a water system’s components and its capacity). Actions should be taken to maintain a 50-foot radius circle around the wellhead clear of potential contaminants. Any contaminant spills within the delineation should be carefully monitored and dealt with. As much of the designated assessment areas are outside the direct jurisdiction of Shilo Ranch Estates, collaboration and partnerships with state and local agencies should be established and are critical to success.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan as the delineation contains some urban and residential land uses. Public education topics could include proper lawn and garden care practices, household hazardous waste disposal methods, proper care and maintenance of septic systems, and the importance of water conservation to name but a few. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil and Water Conservation District, and the Natural Resources Conservation Service.

A community must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Boise Regional Office of the Department of Environmental Quality or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR
SHILO RANCH ESTATES, GARDEN VALLEY, IDAHO

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this assessment means.** Maps showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are included. The list of significant potential contaminant source categories and their rankings used to develop the assessment also is included.

Background

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

Level of Accuracy and Purpose of the Assessment

The Idaho Department of Environmental Quality (DEQ) is required by the U.S. EPA to assess the over 2,900 public drinking water sources in Idaho for their relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area, sensitivity factors associated with the wells, and aquifer characteristics. All assessments for sources active prior to 1999 were completed by May of 2003. Source water assessments for sources activated post-1999 are being developed on a case-by-case basis. The resources and time available to accomplish assessments are limited. An in-depth, site-specific investigation of each significant potential source of contamination is not possible. **Therefore, this assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The ultimate goal of the assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. DEQ recognizes that pollution prevention activities generally require less time and money to implement than treatment of a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a drinking water protection program should be determined by the local community based on its own needs and limitations. Wellhead or drinking water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of the Source Water Quality

The Shilo Ranch Estates (PWS #4080042) drinking water system currently consists of two ground water wells. The system serves approximately 48 people through 25 connections.

According to the State Drinking Water Information System (SDWIS) Database, no VOCs or microbial bacteria have ever been detected in tested water. Traces of the IOCs nitrate, barium, sodium, arsenic, cadmium, fluoride, mercury, and selenium have been detected in tested water. Concentrations of each IOC have been significantly below maximum contaminant levels (MCLs) as set by the Environmental Protection Agency (EPA). No SOCs have been detected in Well #2 Main's water, however, 2,4-D has been detected in Well #3 Backup. The delineation exists within a priority area for the IOC fluoride.

Defining the Zones of Contribution – Delineation

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time-of-travel (TOT) zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. DEQ performed the delineation using a computer model approved by the EPA in determining the 3-year (Zone 1B), 6-year (Zone 2), and 10-year (Zone 3) TOT for water associated with the Snake River Plain aquifer in the vicinity of the Shilo Ranch Estates. The computer model used site-specific data from a variety of sources including local area well logs, and hydrogeologic reports (detailed below).

Hydrogeology

The wells are located in Boise County in the central Idaho Mountains between Ada County and the city of Boise and the Sawtooth Mountains on the east. This country is drained by the Payette and Boise Rivers, Grimes Creek and Bear Valley Creek. The wells are constructed in the Cretaceous granodiorite of the Idaho batholith. Eocene intrusions are present in the Sawtooth Mountains on the east and in the Idaho City area. A north-tending Basin and Range fault, down on the east bounds the system of northeast-striking trans-Challis faults. (P.K. Link, http://imnh.isu.edu/digitalatlas/counties/boise/Boise.pdf 08-07-05)

In the western part of the county, west of Horseshoe Bend on the Payette River is tonalitic intrusive rock of the Idaho batholith, and Miocene Columbia River basalt in the valleys. This basalt flowed north east, or up the valleys from sources to the west in Oregon and westernmost Idaho.

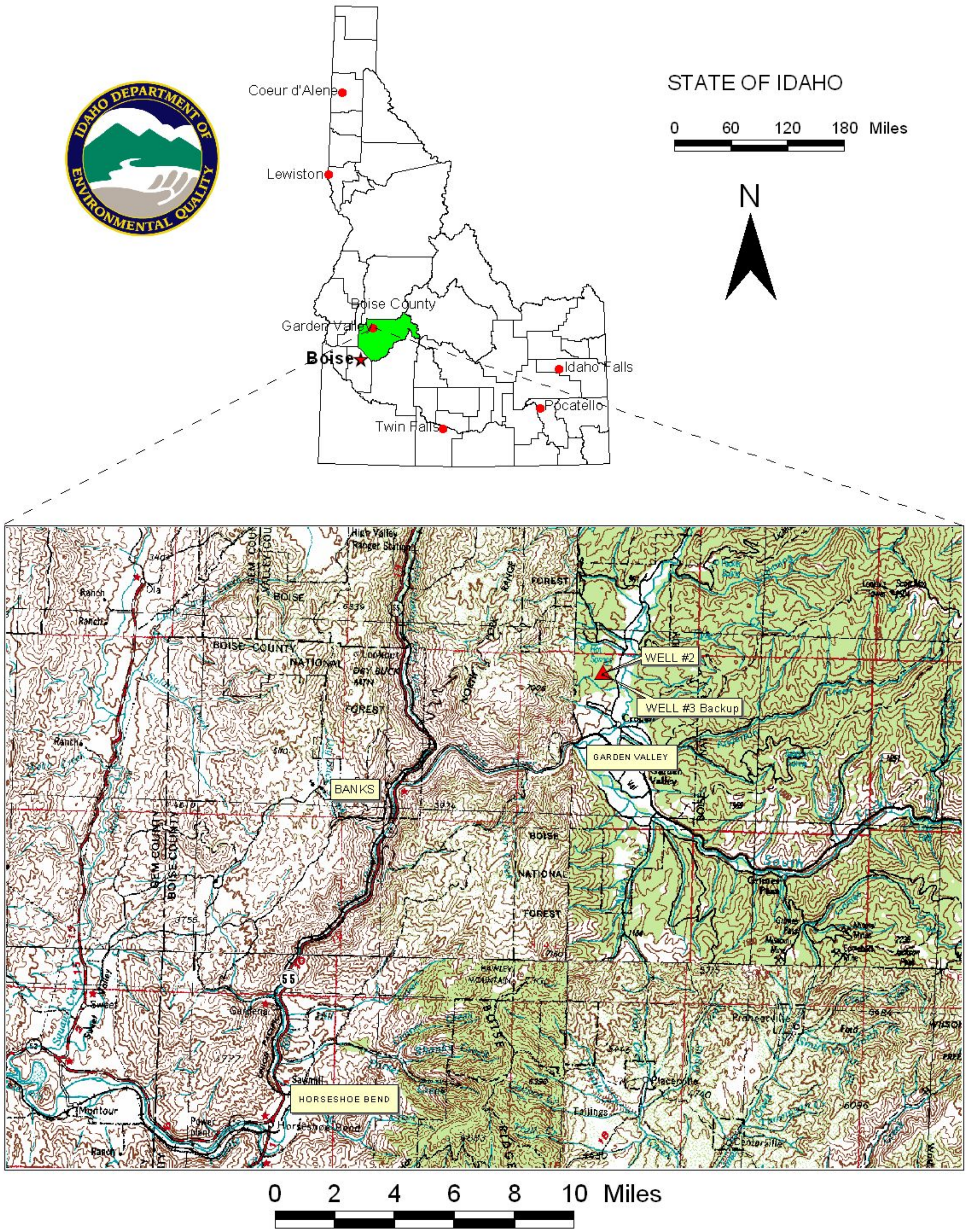
There are numerous wells in the area serving small subdivisions and individual homes. Water in the wells is obtained from fractures in the bedrock and from the alluvium in small streams and the Middle Fork of the Payette River. Some wells in the area constructed in the bedrock are dry. The bedrock aquifer is fed by snowmelt in the spring.

Water levels in the wells were obtained from drillers logs and may not accurately represent current water level conditions. But clearly, the direction of groundwater flow is from the higher elevations in the west toward the Payette River. Springs from the bedrock aquifer feed Warm Springs Creek and other perennial streams that are cut into the bedrock.

Model Description

Although the aquifer is a fracture flow system it may be approximated on a large scale as a porous media. But the model probably does not accurately reflect the flow to individual wells. The direction of flow to the wells is primarily controlled by the topography so the direction of flow for the capture zone is probably accurate. However, the overall extent of the capture zone could be very different than what is presented by the model results, depending on the nature and orientation of the fractures. Pumping by other nearby wells could also significantly influence the shape of the capture zone. Caution should be used when interpreting the results of the model.

FIGURE 1 Site Vicinity Map of Shilo Ranch Estates



The delineated area for Shilo Ranch Estates Well #1 and #2 is a westerly trending lobe approximately 1.2 miles long and 0.2 miles wide (Figure 2). The actual data used in determining the source water assessment delineation area is available from DEQ upon request.

Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of groundwater contamination. The locations of potential sources of contamination within the delineation areas were obtained by field surveys conducted by DEQ and from available databases.

Land use within the area surrounding the Shilo Ranch Estates wells is predominately forest.

It is important to understand that a release may never occur from a potential source of contamination provided they are using best management practices. Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, including educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

Contaminant Source Inventory Process

A two-phased contaminant inventory of the study area was conducted in August and September 2005. The first phase involved identifying and documenting potential contaminant sources within the Shilo Ranch Estates source water assessment area (Figures 2) through the use of computer databases and Geographic Information System (GIS) maps developed by DEQ. The second, or enhanced, phase of the contaminant inventory involved contacting the operator to identify and add any additional potential sources in the delineated areas.

The delineated source water area does not contain any potential contaminant sources.

Section 3. Susceptibility Analyses

The well's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. Appendix A contains the susceptibility analysis worksheet. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

The hydrologic sensitivity of a well is dependent upon four factors: the surface soil composition, the material in the vadose zone (between the land surface and the water table), the depth to first ground water, and the presence of a 50-foot thick fine-grained zone (aquitard) above the producing zone of the well. Slowly draining soils such as silt and clay typically are more protective of ground water than coarse-grained soils such as sand and gravel. Similarly, fine-grained sediments in the subsurface and a water depth of more than 300 feet protect the ground water from contamination.

Well #2 Main and Well #3 Backup both rated moderate susceptibility for hydrologic sensitivity. According to their well logs, each well's vadose zone is composed of predominantly impermeable materials and aquitards are present in both wells. The moderate rating was received because, according to the Natural Resource Conservation Service (NRCS), area soils within the delineation are moderately- to well-drained, and the well logs indicate a water table that is less than 300 feet deep.

Well Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. System construction scores are reduced when information shows that potential contaminants will have a more difficult time reaching the intake of the well. Lower scores imply a system is less vulnerable to contamination. For example, if the well casing and annular seal both extend into a low permeability unit, then the possibility of contamination is reduced and the system construction score goes down. If the highest production interval is more than 100 feet below the water table, then the system is considered to have better buffering capacity. If the wellhead and surface seal are maintained to standards, as outlined in sanitary surveys, then contamination down the well bore is less likely. If the well is protected from surface flooding and is outside the 100-year floodplain, then contamination from surface events is reduced.

According to its well log, Well #2 Main was drilled to a depth of 280 feet below ground surface (bgs) and is screened from 265 feet bgs to 280 feet bgs. An 8-inch casing (0.250 inches thick) extends from the surface to 261 feet bgs into clay. The well was sealed with bentonite from the surface to 40 feet bgs.

Well #2 Main rated moderate susceptibility for system construction. The well is located outside of a 100-year floodplain, the casing and annular seal extend into low permeability units, and the wellhead and surface seal are maintained. The moderate rating resulted because the highest production comes from less than 100 feet below static water levels.

According to its well log, Well #3 Backup was drilled to a depth of 380 feet bgs and has two screened intervals from 270 feet bgs to 350 feet bgs. An 8-inch casing (0.322 inches thick) extends from the surface to 270 feet bgs into clay/sand. The well was sealed with bentonite from the surface to 160 feet bgs.

Well #3 Backup rated low susceptibility for system construction. The well is located outside of a 100-year floodplain. According to the sanitary survey, the wellhead and surface seal are maintained. The well log indicates that both the casing and annular seal extend into low-permeability units, and the highest production comes from more than 100 feet below static water levels.

Current PWS well construction standards can be more stringent than when a well(s) was constructed. The Idaho Department of Water Resources *Well Construction Standards Rules* (1993) require all PWSs to follow DEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works* (1997) during construction. Some of the regulations deal with screening requirements, aquifer pump tests, use of a down-turned casing vent, and thickness of casing. Table 1 of the *Recommended Standards for Water Works* (1997) lists the required steel casing thickness for various diameter wells.

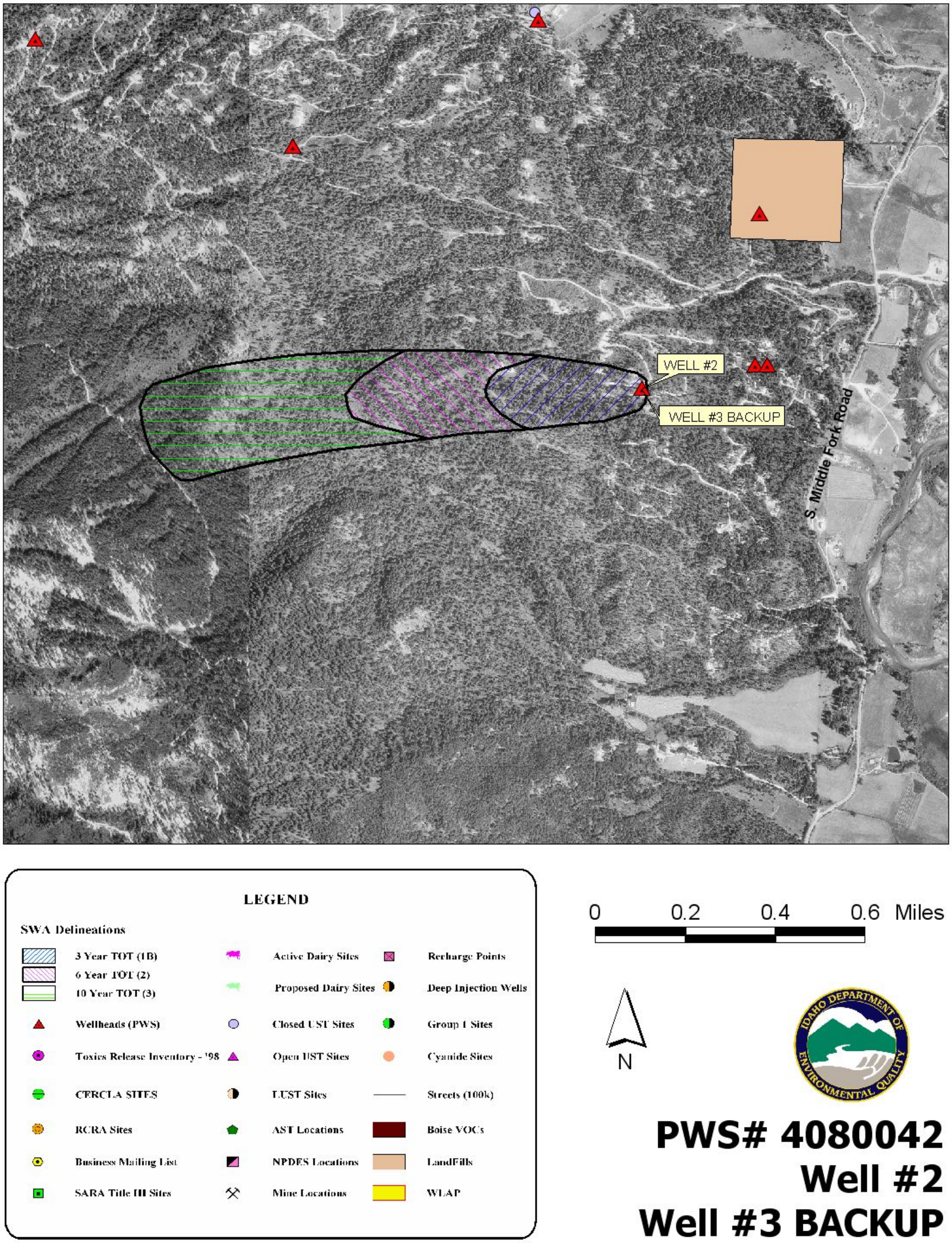
Regulations for steel pipe thickness based on size of pipe

Size of pipe (inches)	Thickness (inches)
≤6	0.280
8	0.322
10	0.365
12-20	0.375

Well tests are required at the design pumping rate for 24 hours or until stabilized drawdown has continued for at least six hours when pumping at 1.5 times the design pumping rate.

Because neither well met all the current construction standards, each was assessed an additional system construction point.

Figure 2. Shilo Ranch Estates Delineation Map and Potential Contaminant Source Locations



Potential Contaminant Sources and Land Use

Land use for Well #2 Main and Well #3 Backup rated low for IOCs, VOCs, SOCs, and microbial contaminants. The lack of agriculture activity and potential contaminant sources were the largest contributors to the low scores. The delineation intersects a priority area for the IOC fluoride.

Final Susceptibility Ranking

A detection above a drinking water standard MCL, any detection of a VOC or SOC, or a detection of total coliform bacteria or fecal coliform bacteria at the wellhead will automatically give a high susceptibility rating to a well despite the land use of the area because a pathway for contamination already exists. Additionally, potential contaminant sources within 50 feet of a wellhead will automatically lead to a high susceptibility rating. Hydrologic sensitivity and system construction scores are heavily weighted in the final scores. Having multiple potential contaminant sources in the 0 to 3-year time of travel zone (Zone 1B) contribute greatly to the overall ranking.

In this case, Well #3 Backup rated automatically high for SOCs due to a detection of 2,4-dichlorophenoxyacetic acid in tested water.

Table 1. Summary of Shilo Ranch Estates Susceptibility Evaluation

	Susceptibility Scores[1]									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	**Final Susceptibility Ranking**			
Well		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
Well #2 Main	L	L	L	L	L	M	L	L	L	L
Well #3 Backup	L	L	L	L	L	M	L	L	H*	L

[1]H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility,
IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical
H* = automatically high susceptibility rating due to detection of 2,4-dichlorophenoxyacetic acid in tested well water.

Susceptibility Summary

In terms of total susceptibility, Well #2 Main rated low susceptibility for IOCs, VOCs, SOCs, and microbial bacteria, and automatically high susceptibility for SOCs. System construction and hydrologic sensitivity rated moderate susceptibility for the well. Land use rated low susceptibility for IOCs, VOCs, SOCs, and microbial bacteria (Table 1)

In terms of total susceptibility, Well #3 Backup rated low susceptibility for IOCs, VOCs, and microbial bacteria, and automatically high susceptibility for SOCs. The automatically high susceptibility ratings are due to a detection of 2, 4-D (2,4-dichlorophenoxyacetic acid) in tested water. If not for the automatically high susceptibility rating, SOCs would have rated low susceptibility. System construction rated low susceptibility and hydrologic sensitivity rated moderate susceptibility for the well. Land use rated low susceptibility for IOCs, VOCs, SOCs, and microbial bacteria (Table 1).

According to the State Drinking Water Information System (SDWIS) Database, no VOCs or microbial bacteria have ever been detected in tested water. Traces of the IOCs nitrate, barium, sodium, arsenic, cadmium, fluoride, mercury, and selenium have been detected in tested water. Concentrations of each IOC have been significantly below maximum contaminant levels (MCLs) as set by the Environmental Protection Agency (EPA). No SOCs have been detected in Well #2 Main's water, however, 2,4-D has been detected in Well #3 Backup. The delineation exists within a priority area for the IOC fluoride.

Section 4. Options for Drinking Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective drinking water protection program is tailored to the particular local drinking water protection area. A community with a fully developed drinking water protection program will incorporate many strategies. For Shilo Ranch Estates, drinking water protection activities should first focus on correcting any deficiencies outlined in the sanitary survey. Actions should be taken to keep a 50-foot radius circle clear around the wellheads. Any spills within the delineation should be carefully monitored and dealt with. As much of the designated protection area is outside the direct jurisdiction Shilo Ranch Estates, making collaboration and partnerships with state and local agencies and industry groups are critical to the success of drinking water protection. The well should maintain sanitary standards regarding wellhead protection. In addition, controls should be emplaced to control the levels of nitrates and fluoride, and monitor the concentrations of arsenic in the drinking water.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A public education program should be a primary focus of any drinking water protection plan as the delineation is near residential land uses areas. Public education topics could include proper household hazardous waste disposal methods, proper care and maintenance of septic systems, and the importance of water conservation to name but a few. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA.

A community must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Boise Regional Office of the DEQ or the Idaho Rural Water Association.

Assistance

Public water suppliers and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Boise Regional DEQ Office	(208) 373-0550
State DEQ Office	(208) 373-0502

Website: http://www.state.id.us/deq

Water suppliers serving fewer than 10,000 persons may contact Melinda Harper (mlharper@idahoruralwater.com), Idaho Rural Water Association, at 1-208-343-7001 for assistance with drinking water protection (formerly wellhead protection) strategies.

POTENTIAL CONTAMINANT INVENTORY
LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ASuperfund≅ is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.

References Cited

Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, 1997. "Recommended Standards for Water Works."

Idaho Department of Environmental Quality, 1997. Design Standards for Public Drinking Water Systems. IDAPA 58.01.08.550.01.

Idaho Department of Water Administration. Well Driller's Report, City of Murphy. 1974.

Idaho Department of Water Resources, 1993. Administrative Rules of the Idaho Water Resource Board: Well Construction Standards Rules. IDAPA 37.03.09.

Newton, G.D., 1991, Geohydrology of the Regional Aquifer System, Western Snake River Plain, Southwestern Idaho, U.S. Geological Survey Water-Supply Paper 1408-G, 52 p.

Petrich, C.R., Simulation of Ground Water Flow in the Lower Boise River Basin, Idaho Water Resources Research Institute Research Report IWRRI2-2004-02, 142 p.

Appendix A

Shilo Ranch Estates
Susceptibility Analysis
Worksheets

The final scores for the susceptibility analysis were determined using the following formulas:

1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)

2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.375)

Final Susceptibility Scoring:

0 - 5 Low Susceptibility

6 - 12 Moderate Susceptibility

≥ 13 High Susceptibility

1. System Construction		SCORE			
Drill Date	7/4/1994				
Driller Log Available	YES				
Sanitary Survey (if yes, indicate date of last survey)	YES	2005			
Well meets IDWR construction standards	NO	1			
Wellhead and surface seal maintained	YES	0			
Casing and annular seal extend to low permeability unit	YES	0			
Highest production 100 feet below static water level	NO	1			
Well located outside the 100 year flood plain	YES	0			
	Total System Construction Score	2 (M)			
2. Hydrologic Sensitivity					
Soils are poorly to moderately drained	NO	2			
Vadose zone composed of gravel, fractured rock or unknown	NO	0			
Depth to first water > 300 feet	NO	1			
Aquitard present with > 50 feet cumulative thickness	YES	0			
	Total Hydrologic Score	3 (M)			
3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	FOREST	0	0	0	0
Farm chemical use high	NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
	Total Potential Contaminant Source/Land Use Score - Zone 1A	0	0	0	0
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	NO	0	0	0	0
(Score = # Sources X 2) 8 Points Maximum		0	0	0	0
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
4 Points Maximum		0	0	0	
Zone 1B contains or intercepts a Group 1 Area	YES	2	0	0	0
Land use Zone 1B	Less Than 25% Agricultural Land	0	0	0	0
	Total Potential Contaminant Source / Land Use Score - Zone 1B	2	0	0	0
Potential Contaminant / Land Use - ZONE II					
Contaminant Sources Present	NO	0	0	0	
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
Land Use Zone II	<25% Agricultural Land	0	0	0	
	Potential Contaminant Source / Land Use Score - Zone II	0	0	0	0
Potential Contaminant / Land Use - ZONE III					
Contaminant Source Present	NO	0	0	0	
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0	
	Total Potential Contaminant Source / Land Use Score - Zone III	0	0	0	0
Cumulative Potential Contaminant / Land Use Score		2(L)	0(L)	0(L)	0(L)
4. Final Susceptibility Source Score		5	5	5	5
5. Final Well Ranking		Low	Low	Low	Low

1. System Construction		SCORE			
Drill Date	5/19/2000				
Driller Log Available	YES				
Sanitary Survey (if yes, indicate date of last survey)	YES	2005			
Well meets IDWR construction standards	NO	1			
Wellhead and surface seal maintained	YES	0			
Casing and annular seal extend to low permeability unit	YES	0			
Highest production 100 feet below static water level	YES	0			
Well located outside the 100 year flood plain	YES	0			
	Total System Construction Score	1 (L)			
2. Hydrologic Sensitivity					
Soils are poorly to moderately drained	NO	2			
Vadose zone composed of gravel, fractured rock or unknown	NO	0			
Depth to first water > 300 feet	NO	1			
Aquitard present with > 50 feet cumulative thickness	YES	0			
	Total Hydrologic Score	3 (M)			
3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	FOREST	0	0	0	0
Farm chemical use high	NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	YES	NO	NO	YES	NO
	Total Potential Contaminant Source/Land Use Score - Zone 1A	0	0	0	0
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	NO	0	0	0	0
(Score = # Sources X 2) 8 Points Maximum		0	0	0	0
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
4 Points Maximum		0	0	0	
Zone 1B contains or intercepts a Group 1 Area	YES	2	0	0	0
Land use Zone 1B	Less Than 25% Agricultural Land	0	0	0	0
	Total Potential Contaminant Source / Land Use Score - Zone 1B	2	0	0	0
Potential Contaminant / Land Use - ZONE II					
Contaminant Sources Present	NO	0	0	0	
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
Land Use Zone II	<25% Agricultural Land	0	0	0	
	Potential Contaminant Source / Land Use Score - Zone II	0	0	0	0
Potential Contaminant / Land Use - ZONE III					
Contaminant Source Present	NO	0	0	0	
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0	
	Total Potential Contaminant Source / Land Use Score - Zone III	0	0	0	0
Cumulative Potential Contaminant / Land Use Score		2(L)	0(L)	0(L)	0(L)
4. Final Susceptibility Source Score		4	4	4	4
5. Final Well Ranking		Low	Low	Auto-High	Low